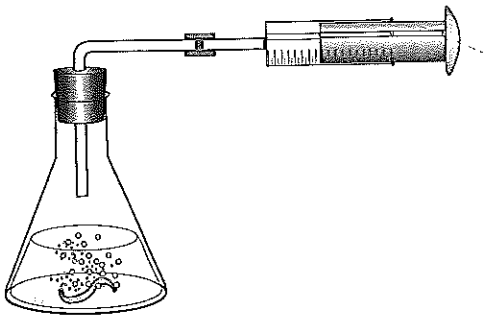
Experiments on Rates of Reaction

Q1 *When magnesium reacts with acid, hydrogen gas is given off. This can be collected and measured as a way of measuring the rate of the reaction.*

In this experiment 25cm³ of dilute hydrochloric acid (0.5mol/dm³) was reacted with a small amount of magnesium ribbon (the acid was in excess).



a) Write a **balanced equation** for this reaction. *(Mg + HCl → etc.)*

b) Use the results below to **plot a graph** of volume collected (vertical axis) against time (horizontal axis).

Time (s)	0	10	20	30	40	50	60	70	80	90	100
Vol. hydrogen (cm³)	0	9	18	27	36	44	50	54	56	57	57

c) **Mark** on your graph where the reaction is going at a constant rate.

d) **How much** hydrogen was collected in the first 25 seconds?

e) **How long** did it take to collect 40cm³ of hydrogen?

f) **Sketch** on the **same axis** the graphs you would expect if the experiment was repeated using 25cm³ of:

1.0 mol/dm³ acid ..... mark this A.

2.0 mol/dm³ acid ..... mark this B.

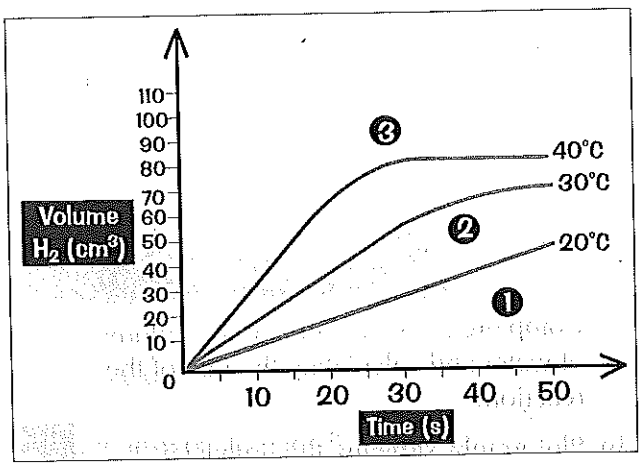
0.25 mol/dm³ acid ..... mark this C.

Q2 *A similar experiment can be carried out to investigate the effect of changing the temperature on the rate of reaction. The graph below shows results from such an experiment. The acid is increasingly warmer in experiments 1, 2 and 3 .*

a) What **simple conclusion** can you draw from these graphs?

b) For each graph, **calculate** the rate over the first 10 seconds.

c) What do you notice about the **change in the rate** of the reaction for an increase of 10°C?



Top Tips:

Lots of graph-drawing practice here. Always make sure you've included a **title, axis labels** and **units** and check the **scale's** about right. They'll look at all these in the Exam, and losing marks is so **easy**.